



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 07:09 AM GMT

PDB ID : 2ZL4  
Title : Crystal structure of H.pylori ClpP S99A in complex with the peptide AAAA  
Authors : Kim, D.Y.; Kim, K.K.  
Deposited on : 2008-04-02  
Resolution : 2.50 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.  
We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)  
A user guide is available at  
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.7 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026688  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk26865

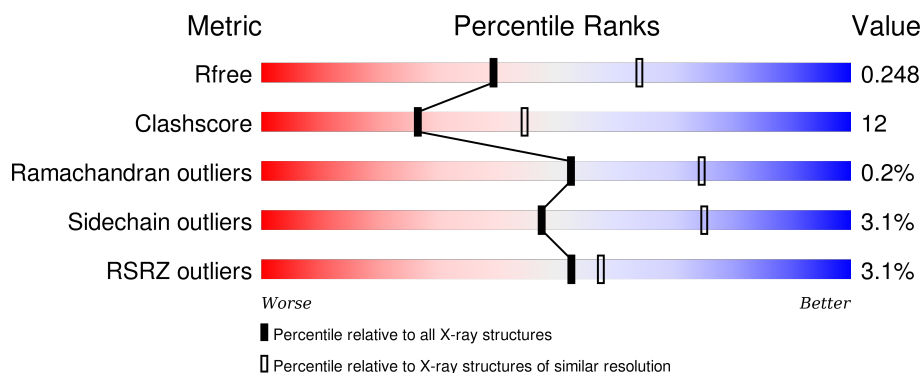
# 1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.50 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	91344	3553 (2.50-2.50)
Clashscore	102246	4242 (2.50-2.50)
Ramachandran outliers	100387	4156 (2.50-2.50)
Sidechain outliers	100360	4158 (2.50-2.50)
RSRZ outliers	91569	3562 (2.50-2.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	196	<div> <div>2%</div> <div>69% 18% • 12%</div> </div>
1	B	196	<div> <div>4%</div> <div>66% 20% • 12%</div> </div>
1	C	196	<div> <div>3%</div> <div>66% 21% • 12%</div> </div>
1	D	196	<div> <div>2%</div> <div>65% 21% • 12%</div> </div>
1	E	196	<div> <div>3%</div> <div>66% 21% • 12%</div> </div>

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Mol	Chain	Length	Quality of chain
1	F	196	
1	G	196	
1	H	196	
1	I	196	
1	J	196	
1	K	196	
1	L	196	
1	M	196	
1	N	196	
2	1	4	
2	2	4	
2	O	4	
2	P	4	
2	Q	4	
2	R	4	
2	S	4	
2	T	4	
2	U	4	
2	V	4	
2	W	4	
2	X	4	
2	Y	4	
2	Z	4	

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 19219 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called ATP-dependent Clp protease proteolytic subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	173	Total	C	N	O	S	0	0	0
			1314	828	222	257	7			
1	B	173	Total	C	N	O	S	0	0	0
			1314	828	222	257	7			
1	C	173	Total	C	N	O	S	0	0	0
			1314	828	222	257	7			
1	D	173	Total	C	N	O	S	0	0	0
			1314	828	222	257	7			
1	E	173	Total	C	N	O	S	0	0	0
			1314	828	222	257	7			
1	F	173	Total	C	N	O	S	0	0	0
			1314	828	222	257	7			
1	G	173	Total	C	N	O	S	0	0	0
			1314	828	222	257	7			
1	H	173	Total	C	N	O	S	0	0	0
			1314	828	222	257	7			
1	I	173	Total	C	N	O	S	0	0	0
			1314	828	222	257	7			
1	J	173	Total	C	N	O	S	0	0	0
			1314	828	222	257	7			
1	K	173	Total	C	N	O	S	0	0	0
			1314	828	222	257	7			
1	L	173	Total	C	N	O	S	0	0	0
			1314	828	222	257	7			
1	M	173	Total	C	N	O	S	0	0	0
			1314	828	222	257	7			
1	N	173	Total	C	N	O	S	0	0	0
			1314	828	222	257	7			

There are 14 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	99	ALA	SER	ENGINEERED	UNP P56156

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Chain	Residue	Modelled	Actual	Comment	Reference
B	99	ALA	SER	ENGINEERED	UNP P56156
C	99	ALA	SER	ENGINEERED	UNP P56156
D	99	ALA	SER	ENGINEERED	UNP P56156
E	99	ALA	SER	ENGINEERED	UNP P56156
F	99	ALA	SER	ENGINEERED	UNP P56156
G	99	ALA	SER	ENGINEERED	UNP P56156
H	99	ALA	SER	ENGINEERED	UNP P56156
I	99	ALA	SER	ENGINEERED	UNP P56156
J	99	ALA	SER	ENGINEERED	UNP P56156
K	99	ALA	SER	ENGINEERED	UNP P56156
L	99	ALA	SER	ENGINEERED	UNP P56156
M	99	ALA	SER	ENGINEERED	UNP P56156
N	99	ALA	SER	ENGINEERED	UNP P56156

- Molecule 2 is a protein called Peptide substrate AAAA.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	O	4	Total	C	N	O	0	0	0
			21	12	4	5			
2	P	4	Total	C	N	O	0	0	0
			21	12	4	5			
2	Q	4	Total	C	N	O	0	0	0
			21	12	4	5			
2	R	4	Total	C	N	O	0	0	0
			21	12	4	5			
2	S	4	Total	C	N	O	0	0	0
			21	12	4	5			
2	T	4	Total	C	N	O	0	0	0
			21	12	4	5			
2	U	4	Total	C	N	O	0	0	0
			21	12	4	5			
2	V	4	Total	C	N	O	0	0	0
			21	12	4	5			
2	W	4	Total	C	N	O	0	0	0
			21	12	4	5			
2	X	4	Total	C	N	O	0	0	0
			21	12	4	5			
2	Y	4	Total	C	N	O	0	0	0
			21	12	4	5			
2	Z	4	Total	C	N	O	0	0	0
			21	12	4	5			
2	1	4	Total	C	N	O	0	0	0
			21	12	4	5			

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	2	4	Total	C	N	O	0	0	0
			21	12	4	5			

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	2	1	Total	O	0	0
			1	1		
3	A	38	Total	O	0	0
			38	38		
3	B	42	Total	O	0	0
			42	42		
3	C	27	Total	O	0	0
			27	27		
3	D	37	Total	O	0	0
			37	37		
3	E	32	Total	O	0	0
			32	32		
3	F	37	Total	O	0	0
			37	37		
3	G	48	Total	O	0	0
			48	48		
3	H	47	Total	O	0	0
			47	47		
3	I	36	Total	O	0	0
			36	36		
3	J	34	Total	O	0	0
			34	34		
3	K	32	Total	O	0	0
			32	32		
3	L	30	Total	O	0	0
			30	30		
3	M	36	Total	O	0	0
			36	36		
3	N	38	Total	O	0	0
			38	38		
3	O	1	Total	O	0	0
			1	1		
3	P	1	Total	O	0	0
			1	1		
3	Q	1	Total	O	0	0
			1	1		

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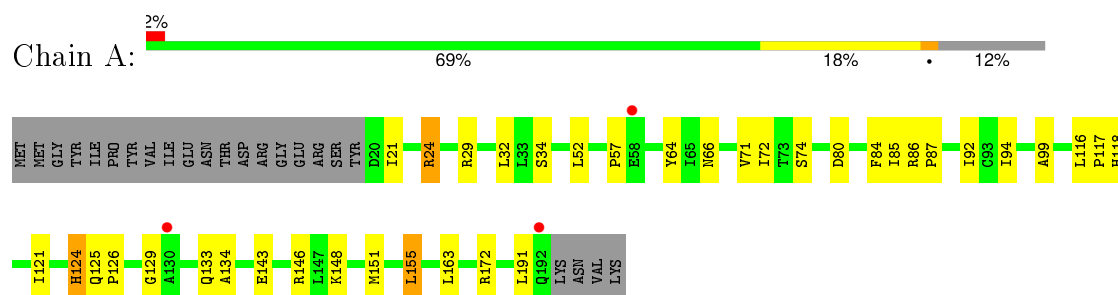
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	R	1	Total 1	O 1	0	0
3	S	1	Total 1	O 1	0	0
3	U	1	Total 1	O 1	0	0
3	V	1	Total 1	O 1	0	0
3	W	1	Total 1	O 1	0	0
3	X	2	Total 2	O 2	0	0
3	Y	2	Total 2	O 2	0	0
3	Z	2	Total 2	O 2	0	0

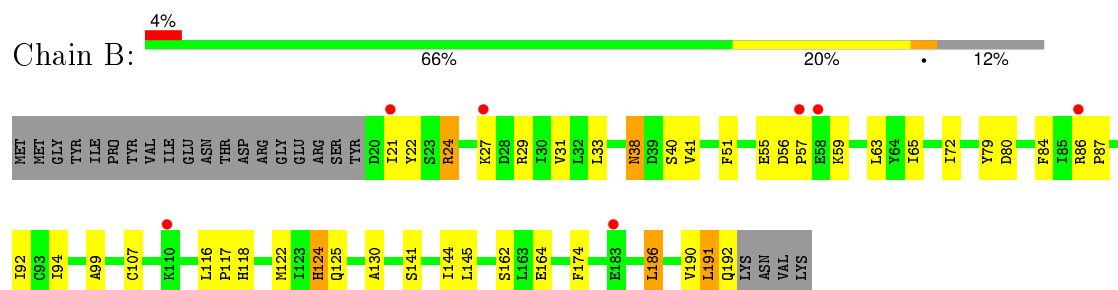
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

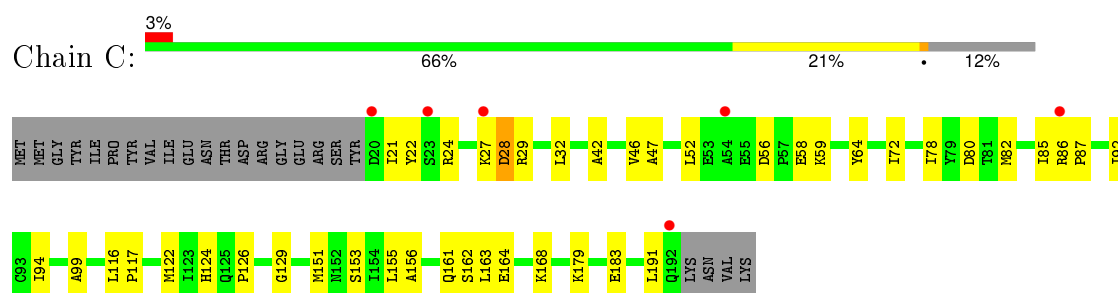
- Molecule 1: ATP-dependent Clp protease proteolytic subunit



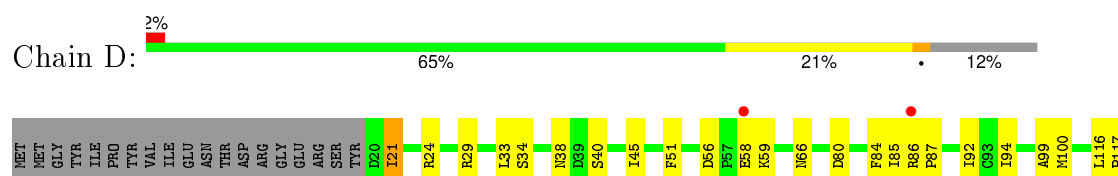
- Molecule 1: ATP-dependent Clp protease proteolytic subunit



- Molecule 1: ATP-dependent Clp protease proteolytic subunit



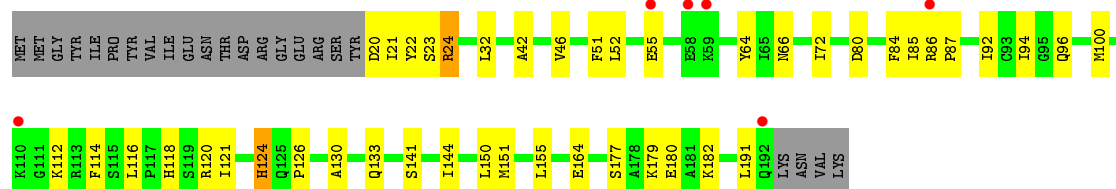
- Molecule 1: ATP-dependent Clp protease proteolytic subunit







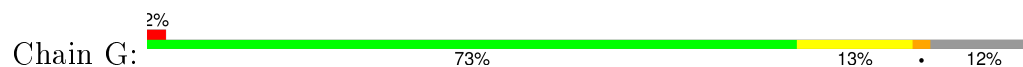
- Molecule 1: ATP-dependent Clp protease proteolytic subunit



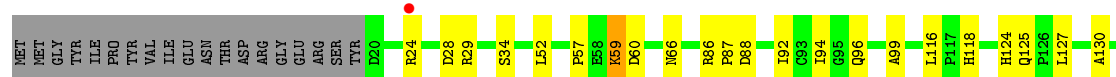
- Molecule 1: ATP-dependent Clp protease proteolytic subunit



- Molecule 1: ATP-dependent Clp protease proteolytic subunit

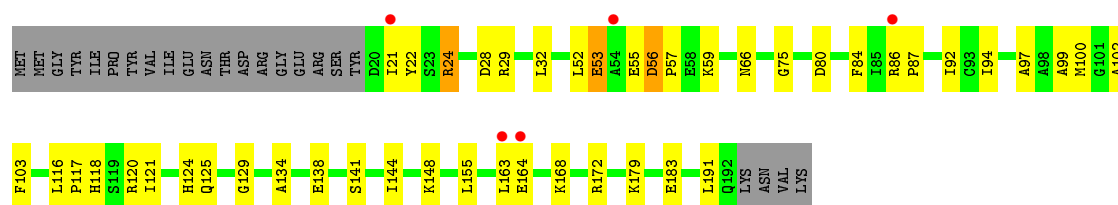


- Molecule 1: ATP-dependent Clp protease proteolytic subunit

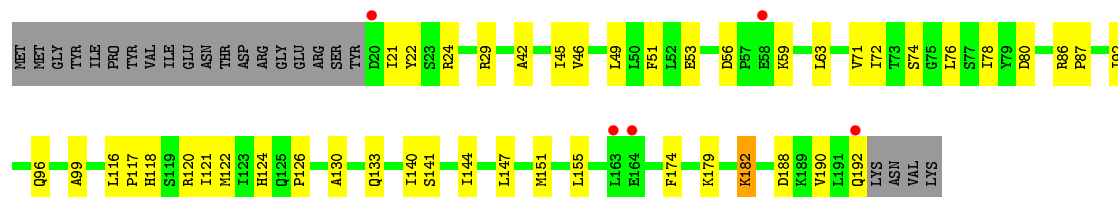


- Molecule 1: ATP-dependent Clp protease proteolytic subunit

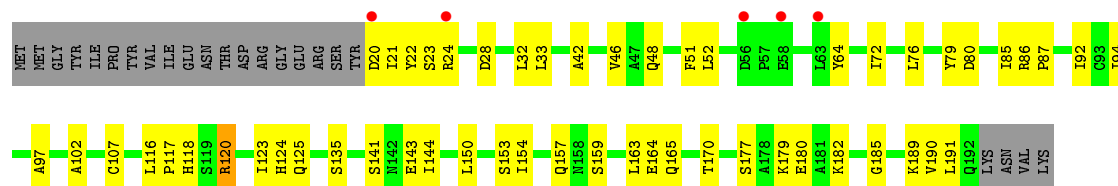




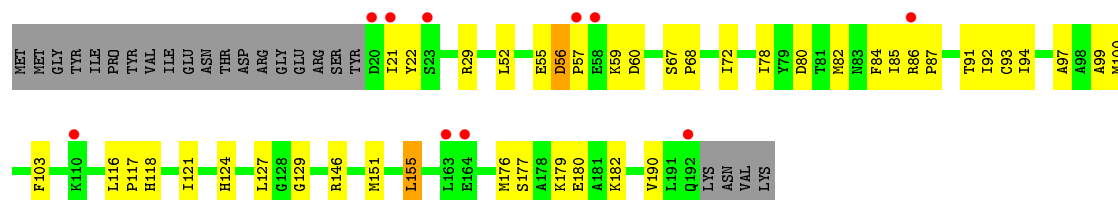
- Molecule 1: ATP-dependent Clp protease proteolytic subunit



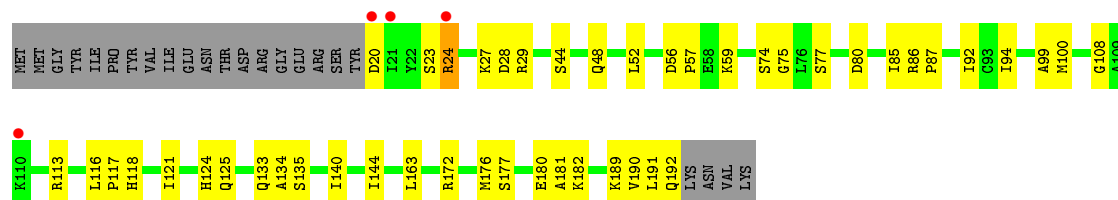
- Molecule 1: ATP-dependent Clp protease proteolytic subunit



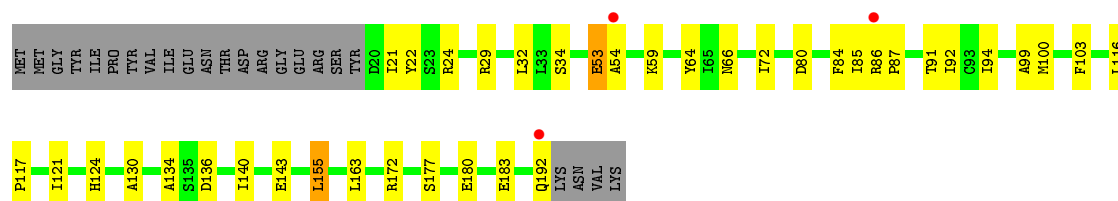
- Molecule 1: ATP-dependent Clp protease proteolytic subunit



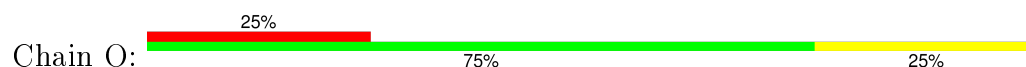
- Molecule 1: ATP-dependent Clp protease proteolytic subunit



- Molecule 1: ATP-dependent Clp protease proteolytic subunit



- Molecule 2: Peptide substrate AAAA



- Molecule 2: Peptide substrate AAAA

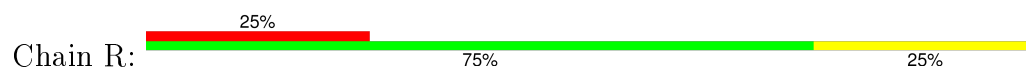


- Molecule 2: Peptide substrate AAAA



There are no outlier residues recorded for this chain.

- Molecule 2: Peptide substrate AAAA




- Molecule 2: Peptide substrate AAAA



- Molecule 2: Peptide substrate AAAA



- Molecule 2: Peptide substrate AAAA

Chain U:  100%


There are no outlier residues recorded for this chain.

- Molecule 2: Peptide substrate AAAA

Chain V:  75% 25%



- Molecule 2: Peptide substrate AAAA

Chain W:  75% 25%



- Molecule 2: Peptide substrate AAAA

Chain X:  75% 25%



- Molecule 2: Peptide substrate AAAA

Chain Y:  50% 100%




- Molecule 2: Peptide substrate AAAA

Chain Z:  25% 50% 50%



- Molecule 2: Peptide substrate AAAA

Chain 1:  25% 75% 25%



- Molecule 2: Peptide substrate AAAA

Chain 2:  75% 25%



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	91.68Å 166.31Å 188.27Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 2.50 29.69 – 2.50	Depositor EDS
% Data completeness (in resolution range)	99.8 (20.00-2.50) 99.9 (29.69-2.50)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.92 (at 2.51Å)	Xtriage
Refinement program	CNS 1.2	Depositor
R, $R_{free}$	0.204 , 0.248 0.204 , 0.248	Depositor DCC
$R_{free}$ test set	10000 reflections (10.02%)	DCC
Wilson B-factor (Å <sup>2</sup> )	32.1	Xtriage
Anisotropy	0.243	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.38 , 53.3	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtriage
Outliers	0 of 99941 reflections	Xtriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	19219	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	34.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.49% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.375 respectively for untwinned datasets, and 0.333, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	0.34	0/1330	0.61	0/1791
1	B	0.35	0/1330	0.58	0/1791
1	C	0.33	0/1330	0.56	0/1791
1	D	0.32	0/1330	0.56	0/1791
1	E	0.34	0/1330	0.57	0/1791
1	F	0.34	0/1330	0.58	0/1791
1	G	0.36	0/1330	0.58	0/1791
1	H	0.36	0/1330	0.60	0/1791
1	I	0.36	0/1330	0.58	0/1791
1	J	0.35	0/1330	0.59	0/1791
1	K	0.32	0/1330	0.57	0/1791
1	L	0.33	0/1330	0.57	0/1791
1	M	0.35	0/1330	0.59	0/1791
1	N	0.35	0/1330	0.59	0/1791
2	1	0.63	0/20	0.62	0/25
2	2	0.66	0/20	0.66	0/25
2	O	0.58	0/20	0.85	0/25
2	P	0.58	0/20	0.66	0/25
2	Q	0.61	0/20	0.62	0/25
2	R	0.63	0/20	0.66	0/25
2	S	0.57	0/20	0.60	0/25
2	T	0.65	0/20	0.88	0/25
2	U	0.61	0/20	0.72	0/25
2	V	0.63	0/20	0.81	0/25
2	W	0.64	0/20	0.62	0/25
2	X	0.60	0/20	0.61	0/25
2	Y	0.56	0/20	0.63	0/25
2	Z	0.60	0/20	0.81	0/25
All	All	0.35	0/18900	0.58	0/25424

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1314	0	1338	39	0
1	B	1314	0	1338	41	0
1	C	1314	0	1338	35	0
1	D	1314	0	1338	37	0
1	E	1314	0	1338	47	0
1	F	1314	0	1338	34	0
1	G	1314	0	1338	36	0
1	H	1314	0	1338	34	0
1	I	1314	0	1338	40	0
1	J	1314	0	1338	40	0
1	K	1314	0	1338	39	0
1	L	1314	0	1338	42	0
1	M	1314	0	1338	45	0
1	N	1314	0	1338	30	0
2	1	21	0	19	2	0
2	2	21	0	19	1	0
2	O	21	0	19	1	0
2	P	21	0	19	2	0
2	Q	21	0	19	0	0
2	R	21	0	19	1	0
2	S	21	0	19	2	0
2	T	21	0	19	1	0
2	U	21	0	19	0	0
2	V	21	0	19	1	0
2	W	21	0	19	1	0
2	X	21	0	19	1	0
2	Y	21	0	19	0	0
2	Z	21	0	19	3	0
3	2	1	0	0	0	0
3	A	38	0	0	0	0
3	B	42	0	0	0	0
3	C	27	0	0	0	0
3	D	37	0	0	0	0
3	E	32	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	F	37	0	0	0	0
3	G	48	0	0	0	0
3	H	47	0	0	0	0
3	I	36	0	0	0	0
3	J	34	0	0	0	0
3	K	32	0	0	0	0
3	L	30	0	0	1	0
3	M	36	0	0	0	0
3	N	38	0	0	1	0
3	O	1	0	0	0	0
3	P	1	0	0	0	0
3	Q	1	0	0	0	0
3	R	1	0	0	0	0
3	S	1	0	0	0	0
3	U	1	0	0	0	0
3	V	1	0	0	0	0
3	W	1	0	0	0	0
3	X	2	0	0	0	0
3	Y	2	0	0	0	0
3	Z	2	0	0	1	0
All	All	19219	0	18998	458	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 12.

All (458) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:K:182:LYS:HE3	1:K:189:LYS:HA	1.47	0.97
1:M:182:LYS:HE2	1:M:189:LYS:HA	1.53	0.91
1:K:32:LEU:HD23	1:K:64:TYR:HB2	1.53	0.88
1:C:47:ALA:HB1	1:D:21:ILE:HD12	1.63	0.79
1:G:126:PRO:HB2	1:G:144:ILE:HD11	1.67	0.77
1:M:74:SER:O	1:M:77:SER:HB3	1.85	0.76
1:K:117:PRO:HD3	1:K:191:LEU:O	1.86	0.76
1:M:100:MET:HG2	2:1:204:ALA:HB3	1.67	0.76
1:A:80:ASP:OD1	1:B:118:HIS:HD2	1.69	0.76
1:I:164:GLU:O	1:I:168:LYS:HG3	1.85	0.75
1:I:57:PRO:HB2	1:I:86:ARG:HD2	1.67	0.75
1:N:32:LEU:HD23	1:N:64:TYR:HB2	1.69	0.73
1:C:80:ASP:HB3	1:D:116:LEU:HD13	1.69	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:51:PHE:HB2	1:C:21:ILE:HD11	1.70	0.71
1:C:42:ALA:O	1:C:46:VAL:HG23	1.92	0.69
1:K:120:ARG:HB3	1:L:146:ARG:HH22	1.57	0.69
1:M:118:HIS:HD2	1:N:80:ASP:OD1	1.74	0.69
1:B:84:PHE:CE1	1:C:191:LEU:HD13	2.28	0.69
1:L:116:LEU:HD13	1:M:80:ASP:HB3	1.74	0.69
1:C:72:ILE:HD11	1:C:126:PRO:HB3	1.74	0.69
1:I:118:HIS:HD2	1:J:80:ASP:OD1	1.75	0.68
1:G:144:ILE:HD13	1:G:144:ILE:O	1.94	0.67
1:E:80:ASP:HB3	1:F:116:LEU:HD13	1.75	0.67
1:A:118:HIS:HD2	1:G:80:ASP:OD1	1.77	0.67
1:E:72:ILE:HG23	1:E:100:MET:HE1	1.75	0.67
1:G:122:MET:HE1	1:G:123:ILE:C	2.16	0.67
1:K:191:LEU:HD13	1:L:84:PHE:CE1	2.30	0.67
1:B:164:GLU:CD	1:B:164:GLU:H	1.99	0.66
1:G:122:MET:CE	1:G:124:HIS:HB3	2.25	0.66
1:H:141:SER:O	1:H:144:ILE:HG22	1.95	0.66
1:A:84:PHE:CE1	1:B:191:LEU:HD13	2.29	0.66
1:H:57:PRO:HB2	1:H:86:ARG:HE	1.61	0.66
1:M:177:SER:OG	1:M:180:GLU:HG3	1.95	0.65
1:N:180:GLU:O	1:N:183:GLU:HG2	1.96	0.65
1:J:190:VAL:O	1:J:192:GLN:HG3	1.96	0.65
1:L:99:ALA:HB1	2:Z:204:ALA:C	2.18	0.64
1:K:116:LEU:HD13	1:L:80:ASP:HB3	1.78	0.64
1:M:75:GLY:HA3	1:M:100:MET:HE2	1.80	0.64
1:F:53:GLU:HG3	1:F:85:ILE:HB	1.80	0.63
1:D:134:ALA:HB3	1:K:125:GLN:NE2	2.14	0.63
1:N:192:GLN:HG2	1:N:192:GLN:O	1.98	0.63
1:F:179:LYS:O	1:F:183:GLU:HG3	1.98	0.63
1:G:141:SER:O	1:G:144:ILE:HG22	1.98	0.63
1:N:92:ILE:HD12	1:N:92:ILE:N	2.14	0.63
1:J:116:LEU:HD13	1:K:80:ASP:HB3	1.81	0.63
1:J:141:SER:O	1:J:144:ILE:HG22	1.98	0.62
1:L:182:LYS:HD3	1:L:182:LYS:C	2.20	0.62
1:K:182:LYS:HD2	1:K:190:VAL:HG23	1.80	0.61
1:L:92:ILE:N	1:L:92:ILE:HD12	2.16	0.61
1:E:72:ILE:HG12	1:E:100:MET:CE	2.31	0.61
1:A:29:ARG:NH2	1:A:52:LEU:O	2.34	0.61
1:G:144:ILE:HD12	1:N:134:ALA:HB2	1.83	0.60
1:D:80:ASP:OD1	1:E:118:HIS:HD2	1.84	0.60
1:B:38:ASN:C	1:B:38:ASN:HD22	2.04	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:N:91:THR:C	1:N:92:ILE:HD12	2.22	0.60
1:E:92:ILE:HD12	1:E:92:ILE:N	2.16	0.60
1:L:29:ARG:NH1	1:L:59:LYS:O	2.35	0.60
1:F:32:LEU:HD23	1:F:64:TYR:HB2	1.82	0.60
1:D:34:SER:HA	1:D:66:ASN:O	2.02	0.60
1:A:72:ILE:HD11	1:A:126:PRO:HB3	1.84	0.59
1:E:21:ILE:HG23	1:E:22:TYR:N	2.17	0.59
1:K:159:SER:HA	1:K:185:GLY:O	2.02	0.59
1:E:151:MET:O	1:E:155:LEU:HB2	2.02	0.59
1:C:179:LYS:O	1:C:183:GLU:HG3	2.02	0.59
1:I:55:GLU:O	1:I:56:ASP:HB2	2.03	0.59
1:L:182:LYS:HD3	1:L:182:LYS:O	2.02	0.59
1:L:29:ARG:NH2	1:L:52:LEU:O	2.35	0.59
1:L:94:ILE:HG22	1:L:116:LEU:HD12	1.85	0.58
1:D:84:PHE:CE1	1:E:191:LEU:HD13	2.38	0.58
1:B:51:PHE:CB	1:C:21:ILE:HD11	2.32	0.58
1:G:122:MET:HE1	1:G:124:HIS:HB3	1.86	0.58
1:C:29:ARG:NH2	1:C:52:LEU:O	2.35	0.58
1:E:72:ILE:HD11	1:E:126:PRO:HB3	1.86	0.57
1:F:134:ALA:HB3	1:M:125:GLN:HE21	1.69	0.57
1:G:126:PRO:HB2	1:G:144:ILE:CD1	2.34	0.57
1:D:94:ILE:HG22	1:D:116:LEU:CD1	2.34	0.57
1:B:29:ARG:NH1	1:B:59:LYS:O	2.36	0.57
1:L:29:ARG:HD3	1:L:60:ASP:O	2.04	0.57
1:G:24:ARG:HD3	1:G:24:ARG:O	2.05	0.57
1:N:117:PRO:HD3	1:N:192:GLN:HA	1.85	0.57
1:M:182:LYS:HE3	1:M:190:VAL:HG23	1.85	0.57
1:M:56:ASP:CG	1:M:59:LYS:HG2	2.24	0.57
1:F:57:PRO:HB2	1:F:86:ARG:HD2	1.87	0.57
1:K:141:SER:O	1:K:144:ILE:HG22	2.04	0.57
1:C:32:LEU:HD12	1:C:64:TYR:HB2	1.87	0.57
1:F:80:ASP:OD1	1:G:118:HIS:HD2	1.88	0.57
1:C:80:ASP:OD1	1:D:118:HIS:HD2	1.88	0.57
1:M:92:ILE:N	1:M:92:ILE:HD12	2.19	0.57
1:C:151:MET:O	1:C:155:LEU:HB2	2.04	0.57
1:D:21:ILE:HD13	1:D:21:ILE:O	2.05	0.56
1:J:29:ARG:NE	1:J:59:LYS:HB3	2.20	0.56
1:J:96:GLN:NE2	1:J:120:ARG:HE	2.04	0.56
1:I:29:ARG:NH1	1:I:59:LYS:O	2.38	0.56
1:E:100:MET:HB2	2:S:204:ALA:HB3	1.88	0.56
1:L:179:LYS:HD3	1:L:190:VAL:HG21	1.86	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:153:SER:O	1:D:157:GLN:HG3	2.06	0.56
1:D:85:ILE:HD12	1:D:87:PRO:HG2	1.87	0.56
1:M:191:LEU:HD13	1:N:84:PHE:CE1	2.40	0.56
1:L:94:ILE:HG22	1:L:116:LEU:CD1	2.35	0.56
1:L:121:ILE:N	1:L:121:ILE:HD12	2.20	0.56
1:E:80:ASP:OD1	1:F:118:HIS:HD2	1.88	0.56
1:M:99:ALA:HB1	2:1:204:ALA:C	2.26	0.56
1:B:38:ASN:ND2	1:B:41:VAL:H	2.03	0.56
1:E:32:LEU:HD23	1:E:64:TYR:HB2	1.87	0.56
1:D:92:ILE:N	1:D:92:ILE:HD12	2.21	0.56
1:B:24:ARG:HE	1:B:27:LYS:HD2	1.69	0.56
1:I:24:ARG:C	1:I:24:ARG:HD3	2.27	0.56
1:D:29:ARG:NH1	1:D:59:LYS:O	2.38	0.55
1:I:172:ARG:NH2	1:J:133:GLN:OE1	2.39	0.55
1:J:42:ALA:O	1:J:46:VAL:HG23	2.07	0.55
1:J:24:ARG:HH11	1:J:24:ARG:HG3	1.71	0.55
1:H:29:ARG:NH1	1:H:59:LYS:HB3	2.22	0.55
1:A:80:ASP:HB3	1:B:116:LEU:HD13	1.89	0.55
1:B:57:PRO:HA	1:B:87:PRO:HG3	1.89	0.55
1:G:122:MET:HE3	1:G:173:ASP:HA	1.89	0.55
1:B:190:VAL:O	1:B:192:GLN:N	2.40	0.55
1:A:191:LEU:HD13	1:G:84:PHE:CE1	2.42	0.55
1:A:21:ILE:HD12	1:A:21:ILE:H	1.72	0.55
1:L:21:ILE:HG23	1:L:22:TYR:N	2.22	0.55
1:C:86:ARG:N	1:C:87:PRO:HD2	2.21	0.55
1:H:118:HIS:HD2	1:I:80:ASP:OD2	1.90	0.55
1:K:118:HIS:HD2	1:L:80:ASP:OD1	1.90	0.54
1:D:159:SER:HA	1:D:185:GLY:O	2.06	0.54
1:A:125:GLN:NE2	1:H:134:ALA:HB3	2.23	0.54
1:B:24:ARG:HH21	1:B:27:LYS:CB	2.20	0.54
1:F:125:GLN:HE21	1:M:134:ALA:HB3	1.73	0.54
1:A:85:ILE:HD12	1:A:87:PRO:HG2	1.90	0.54
1:H:116:LEU:HD13	1:I:80:ASP:HB3	1.90	0.54
1:J:92:ILE:HD12	1:J:92:ILE:N	2.22	0.54
1:D:125:GLN:NE2	1:K:135:SER:H	2.06	0.54
1:J:21:ILE:HG23	1:J:22:TYR:N	2.23	0.53
1:F:48:GLN:O	1:F:52:LEU:HD22	2.08	0.53
1:B:92:ILE:HD12	1:B:92:ILE:N	2.23	0.53
1:G:56:ASP:OD1	1:G:59:LYS:HG3	2.07	0.53
1:D:161:GLN:HB2	1:D:166:ILE:HD11	1.90	0.53
1:B:141:SER:O	1:B:144:ILE:HG22	2.09	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:84:PHE:HE1	1:F:191:LEU:HG	1.73	0.53
1:H:29:ARG:NH1	1:H:59:LYS:O	2.42	0.53
1:G:27:LYS:HD3	1:G:27:LYS:O	2.08	0.53
1:G:92:ILE:N	1:G:92:ILE:HD12	2.24	0.53
1:B:31:VAL:CG2	1:B:63:LEU:HD13	2.39	0.52
1:I:57:PRO:CB	1:I:86:ARG:HD2	2.37	0.52
1:I:66:ASN:HB2	1:I:94:ILE:HG13	1.91	0.52
1:L:72:ILE:HG23	1:L:100:MET:HE1	1.91	0.52
1:M:190:VAL:O	1:M:192:GLN:HG3	2.09	0.52
1:F:84:PHE:CE1	1:G:191:LEU:HD13	2.44	0.52
1:L:118:HIS:HD2	1:M:80:ASP:OD1	1.92	0.52
1:H:57:PRO:CB	1:H:86:ARG:HE	2.20	0.52
1:C:153:SER:HA	1:C:163:LEU:HD23	1.91	0.52
1:G:122:MET:HE2	1:G:174:PHE:H	1.75	0.52
1:A:125:GLN:HB2	1:A:126:PRO:HD2	1.92	0.52
1:C:162:SER:HB2	1:C:164:GLU:OE1	2.10	0.52
1:E:66:ASN:HA	1:E:96:GLN:O	2.10	0.52
1:J:118:HIS:CD2	1:K:154:ILE:HD11	2.44	0.52
1:G:72:ILE:HG23	1:G:100:MET:HE1	1.91	0.52
1:A:172:ARG:NH2	1:G:133:GLN:OE1	2.36	0.52
1:H:133:GLN:OE1	1:N:172:ARG:NH2	2.37	0.52
1:B:84:PHE:CZ	1:C:191:LEU:HD13	2.45	0.52
1:A:117:PRO:HD3	1:A:191:LEU:O	2.10	0.52
1:A:21:ILE:N	1:A:21:ILE:HD12	2.25	0.52
1:A:32:LEU:HD23	1:A:64:TYR:HB2	1.92	0.52
1:M:44:SER:O	1:M:48:GLN:HG3	2.10	0.52
1:G:122:MET:CE	1:G:173:ASP:HA	2.40	0.51
1:J:151:MET:HE2	1:J:151:MET:HA	1.91	0.51
1:E:24:ARG:O	1:E:24:ARG:HD3	2.10	0.51
1:F:21:ILE:HG23	1:F:22:TYR:N	2.26	0.51
1:F:99:ALA:HB1	2:T:204:ALA:C	2.30	0.51
1:D:177:SER:OG	1:D:180:GLU:HG3	2.10	0.51
1:J:59:LYS:O	1:J:87:PRO:HB3	2.10	0.51
1:M:24:ARG:HG2	1:M:24:ARG:NH1	2.26	0.51
1:E:21:ILE:HG23	1:E:22:TYR:H	1.75	0.51
1:F:134:ALA:HB3	1:M:125:GLN:NE2	2.24	0.51
1:J:71:VAL:HB	1:J:74:SER:OG	2.11	0.51
1:D:80:ASP:HB3	1:E:116:LEU:HD13	1.93	0.51
1:B:94:ILE:HG13	1:B:94:ILE:O	2.11	0.51
1:C:164:GLU:H	1:C:164:GLU:CD	2.14	0.51
1:J:147:LEU:O	1:J:151:MET:HG2	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:N:103:PHE:HD1	1:N:155:LEU:HD13	1.76	0.50
1:A:124:HIS:HD2	1:A:124:HIS:O	1.94	0.50
1:F:48:GLN:HA	1:G:21:ILE:CD1	2.41	0.50
1:G:122:MET:HE3	1:G:124:HIS:HB3	1.94	0.50
1:H:57:PRO:HB2	1:H:86:ARG:NE	2.24	0.50
1:B:24:ARG:HH21	1:B:27:LYS:HB3	1.76	0.50
1:I:97:ALA:O	1:I:102:ALA:HB2	2.12	0.50
1:D:134:ALA:HB3	1:K:125:GLN:HE21	1.75	0.50
1:M:75:GLY:HA3	1:M:100:MET:CE	2.41	0.50
1:I:179:LYS:O	1:I:183:GLU:HG3	2.12	0.50
1:M:24:ARG:NH2	1:M:27:LYS:HD3	2.26	0.50
1:K:86:ARG:N	1:K:87:PRO:CD	2.74	0.50
1:K:92:ILE:N	1:K:92:ILE:HD12	2.26	0.50
1:E:20:ASP:HB3	1:E:23:SER:HB2	1.94	0.50
1:H:151:MET:O	1:H:155:LEU:HB2	2.12	0.50
1:K:164:GLU:CD	1:K:164:GLU:H	2.15	0.50
1:C:92:ILE:N	1:C:92:ILE:HD12	2.27	0.50
1:I:120:ARG:C	1:I:121:ILE:HD12	2.32	0.50
1:E:133:GLN:HA	1:L:127:LEU:HD23	1.92	0.50
1:F:164:GLU:HB3	1:F:168:LYS:NZ	2.27	0.50
1:D:99:ALA:HB1	2:R:204:ALA:C	2.33	0.49
1:F:140:ILE:O	1:F:144:ILE:HG12	2.12	0.49
1:E:164:GLU:OE2	1:E:164:GLU:N	2.39	0.49
1:C:21:ILE:HG23	1:C:22:TYR:N	2.27	0.49
1:M:116:LEU:HD13	1:N:80:ASP:HB3	1.94	0.49
1:A:94:ILE:O	1:A:94:ILE:HG13	2.11	0.49
1:J:122:MET:HA	1:J:174:PHE:O	2.12	0.49
1:I:99:ALA:HB1	2:W:204:ALA:C	2.32	0.49
1:D:33:LEU:HD13	1:D:45:ILE:HG13	1.94	0.49
1:I:117:PRO:HD3	1:I:191:LEU:O	2.11	0.49
1:G:144:ILE:HD12	1:N:134:ALA:CB	2.43	0.49
1:B:80:ASP:O	1:B:84:PHE:HB2	2.13	0.49
1:L:116:LEU:HB3	1:L:117:PRO:HD2	1.94	0.49
1:E:24:ARG:HD3	1:E:24:ARG:C	2.33	0.49
1:K:123:ILE:HG13	1:K:170:THR:HG22	1.93	0.49
1:E:120:ARG:C	1:E:121:ILE:HD12	2.33	0.49
1:F:20:ASP:OD2	1:F:23:SER:N	2.45	0.49
1:N:136:ASP:O	1:N:140:ILE:HG12	2.13	0.49
1:I:24:ARG:O	1:I:24:ARG:HD3	2.13	0.49
1:E:86:ARG:N	1:E:87:PRO:HD2	2.27	0.48
1:B:33:LEU:HD12	1:B:65:ILE:HG23	1.94	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:92:ILE:HD12	1:A:92:ILE:N	2.27	0.48
1:G:172:ARG:NH1	1:M:172:ARG:HH12	2.11	0.48
1:N:29:ARG:NH1	1:N:59:LYS:O	2.46	0.48
1:I:121:ILE:HD12	1:I:121:ILE:N	2.28	0.48
1:M:94:ILE:HG22	1:M:116:LEU:CD1	2.44	0.48
1:F:92:ILE:HD12	1:F:92:ILE:N	2.28	0.48
1:I:21:ILE:HG23	1:I:22:TYR:N	2.29	0.48
1:M:182:LYS:CE	1:M:189:LYS:HA	2.35	0.48
1:J:121:ILE:N	1:J:121:ILE:HD12	2.29	0.48
1:D:56:ASP:OD1	1:D:59:LYS:HE3	2.14	0.48
1:E:130:ALA:O	1:L:129:GLY:HA2	2.14	0.48
1:E:177:SER:OG	1:E:180:GLU:HG3	2.14	0.48
1:E:72:ILE:HD12	2:S:202:ALA:HB1	1.94	0.48
1:L:179:LYS:HG2	3:L:204:HOH:O	2.13	0.48
1:D:86:ARG:N	1:D:87:PRO:HD2	2.29	0.48
1:A:125:GLN:HE21	1:H:134:ALA:HB3	1.79	0.47
1:M:29:ARG:NE	1:M:59:LYS:HB2	2.29	0.47
1:G:117:PRO:HD3	1:G:191:LEU:O	2.14	0.47
1:A:124:HIS:CD2	1:A:124:HIS:C	2.87	0.47
1:G:36:GLU:HG2	1:G:68:PRO:HG2	1.96	0.47
1:H:92:ILE:N	1:H:92:ILE:HD12	2.29	0.47
1:L:176:MET:HB2	1:L:180:GLU:HB2	1.96	0.47
1:L:57:PRO:HB2	1:L:86:ARG:HD2	1.96	0.47
1:N:34:SER:HA	1:N:66:ASN:O	2.14	0.47
1:A:143:GLU:OE1	1:A:146:ARG:HD3	2.15	0.47
1:J:120:ARG:C	1:J:121:ILE:HD12	2.35	0.47
1:D:116:LEU:HB3	1:D:117:PRO:HD2	1.96	0.47
1:C:29:ARG:NH1	1:C:59:LYS:O	2.47	0.47
1:J:96:GLN:HE21	1:J:120:ARG:HE	1.62	0.47
1:D:51:PHE:HD1	1:E:24:ARG:HD2	1.80	0.47
1:B:162:SER:HB2	1:B:164:GLU:OE2	2.14	0.47
1:K:150:LEU:O	1:K:153:SER:HB3	2.15	0.47
1:G:163:LEU:O	1:G:163:LEU:HD23	2.13	0.47
1:B:125:GLN:NE2	1:I:134:ALA:HB3	2.30	0.47
1:N:85:ILE:HD12	1:N:87:PRO:HG2	1.97	0.47
1:M:108:GLY:HA3	1:M:113:ARG:HG2	1.96	0.47
1:B:164:GLU:N	1:B:164:GLU:CD	2.68	0.47
1:J:179:LYS:NZ	1:J:192:GLN:HE22	2.12	0.47
1:E:94:ILE:HG22	1:E:116:LEU:HD12	1.97	0.47
1:F:48:GLN:HA	1:G:21:ILE:HD11	1.97	0.47
1:F:164:GLU:O	1:F:168:LYS:HG3	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:164:GLU:O	1:D:168:LYS:HG3	2.15	0.47
1:M:86:ARG:N	1:M:87:PRO:CD	2.77	0.47
1:I:53:GLU:OE1	1:I:87:PRO:HD3	2.15	0.47
1:J:179:LYS:NZ	1:J:192:GLN:NE2	2.63	0.47
1:D:100:MET:HE1	1:D:151:MET:SD	2.55	0.47
1:K:20:ASP:OD2	1:K:23:SER:N	2.47	0.47
1:I:118:HIS:CD2	1:J:80:ASP:OD1	2.64	0.46
1:N:177:SER:OG	1:N:180:GLU:HG3	2.15	0.46
1:M:24:ARG:HG2	1:M:24:ARG:HH11	1.80	0.46
1:E:20:ASP:HB3	1:E:23:SER:CB	2.46	0.46
1:M:57:PRO:HA	1:M:87:PRO:HG3	1.97	0.46
1:K:177:SER:OG	1:K:180:GLU:HG3	2.16	0.46
1:E:51:PHE:CB	1:F:21:ILE:HD11	2.45	0.46
1:H:177:SER:OG	1:H:180:GLU:HG3	2.14	0.46
1:I:92:ILE:HD12	1:I:92:ILE:N	2.31	0.46
1:D:189:LYS:HE2	1:D:191:LEU:HD23	1.97	0.46
1:A:94:ILE:HG22	1:A:116:LEU:CD1	2.46	0.46
1:E:94:ILE:HG22	1:E:116:LEU:CD1	2.45	0.46
1:C:56:ASP:OD1	1:C:58:GLU:HB2	2.15	0.46
1:I:75:GLY:HA3	1:I:100:MET:HE2	1.97	0.46
1:F:94:ILE:HG22	1:F:116:LEU:CD1	2.45	0.46
1:A:86:ARG:N	1:A:87:PRO:HD2	2.31	0.46
1:I:125:GLN:NE2	1:I:148:LYS:NZ	2.64	0.46
1:C:116:LEU:HB3	1:C:117:PRO:HD2	1.98	0.46
1:J:24:ARG:HG3	1:J:24:ARG:NH1	2.31	0.46
1:N:86:ARG:N	1:N:87:PRO:HD2	2.31	0.46
1:I:100:MET:HE1	1:I:103:PHE:CD2	2.51	0.46
1:N:53:GLU:HG3	1:N:54:ALA:N	2.31	0.46
1:K:94:ILE:O	1:K:94:ILE:HG13	2.15	0.46
1:F:32:LEU:CD2	1:F:64:TYR:HB2	2.46	0.46
1:I:100:MET:CE	1:I:103:PHE:CD2	2.99	0.46
1:A:151:MET:O	1:A:155:LEU:HB2	2.15	0.46
1:M:94:ILE:HG13	1:M:94:ILE:O	2.16	0.46
1:M:121:ILE:HG13	1:M:181:ALA:HB2	1.97	0.46
1:J:45:ILE:O	1:J:49:LEU:HG	2.16	0.46
1:N:116:LEU:HB3	1:N:117:PRO:HD2	1.98	0.45
1:K:72:ILE:O	1:K:76:LEU:HG	2.15	0.45
1:N:121:ILE:N	1:N:121:ILE:HD12	2.31	0.45
1:H:94:ILE:HG22	1:H:116:LEU:CD1	2.46	0.45
1:F:192:GLN:OE1	1:F:192:GLN:HA	2.16	0.45
1:E:42:ALA:O	1:E:46:VAL:HG23	2.15	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:125:GLN:NE2	1:A:148:LYS:NZ	2.64	0.45
1:K:21:ILE:HG23	1:K:22:TYR:N	2.31	0.45
1:C:78:ILE:O	1:C:82:MET:HG3	2.17	0.45
1:L:91:THR:C	1:L:92:ILE:HD12	2.37	0.45
1:A:99:ALA:HB1	2:O:204:ALA:C	2.37	0.45
1:H:149:GLY:O	1:H:153:SER:HB2	2.16	0.45
1:M:116:LEU:HB3	1:M:117:PRO:HD2	1.98	0.45
1:M:121:ILE:HG13	1:M:181:ALA:CB	2.47	0.45
1:L:59:LYS:O	1:L:87:PRO:HB3	2.16	0.45
1:L:103:PHE:HD1	1:L:155:LEU:HD13	1.82	0.45
1:I:29:ARG:NH2	1:I:52:LEU:O	2.50	0.45
1:J:130:ALA:HB2	1:J:140:ILE:HG21	1.98	0.45
1:C:94:ILE:HG22	1:C:116:LEU:HD12	1.98	0.44
1:L:67:SER:HA	1:L:68:PRO:HD3	1.73	0.44
1:I:57:PRO:HA	1:I:87:PRO:HG3	1.99	0.44
1:L:94:ILE:HG13	1:L:94:ILE:O	2.18	0.44
1:I:116:LEU:HB3	1:I:117:PRO:HD2	2.00	0.44
1:B:145:LEU:HD11	1:I:138:GLU:HB2	1.99	0.44
1:M:20:ASP:HB3	1:M:23:SER:HB2	1.99	0.44
1:E:141:SER:O	1:E:144:ILE:HG22	2.17	0.44
1:N:72:ILE:HG12	1:N:100:MET:CE	2.47	0.44
1:N:143:GLU:OE1	1:N:143:GLU:HA	2.18	0.44
1:M:85:ILE:HB	1:M:87:PRO:HD2	1.99	0.44
1:H:191:LEU:HD13	1:I:84:PHE:CE1	2.53	0.44
1:B:38:ASN:ND2	1:B:40:SER:H	2.15	0.44
1:B:125:GLN:HE21	1:I:134:ALA:HB3	1.83	0.44
1:C:24:ARG:HD3	1:C:24:ARG:O	2.17	0.44
1:G:143:GLU:OE1	1:G:143:GLU:HA	2.18	0.44
1:D:94:ILE:HG22	1:D:116:LEU:HD12	1.99	0.44
1:J:21:ILE:CG2	1:J:22:TYR:N	2.80	0.44
1:D:155:LEU:HA	1:D:155:LEU:HD12	1.81	0.44
1:H:34:SER:HA	1:H:66:ASN:O	2.18	0.44
1:E:72:ILE:HG12	1:E:100:MET:HE1	1.99	0.44
1:H:66:ASN:ND2	1:H:96:GLN:H	2.16	0.44
1:B:186:LEU:HA	1:B:186:LEU:HD12	1.80	0.44
1:A:57:PRO:HA	1:A:87:PRO:HD3	2.00	0.44
1:F:125:GLN:HE22	1:M:135:SER:H	1.64	0.44
1:F:125:GLN:NE2	1:M:134:ALA:HB3	2.33	0.44
1:J:99:ALA:HB1	2:X:204:ALA:C	2.37	0.44
1:B:84:PHE:HE1	1:C:191:LEU:HD13	1.81	0.43
1:H:57:PRO:HA	1:H:87:PRO:HG3	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:86:ARG:HH11	1:H:86:ARG:HG3	1.82	0.43
1:B:122:MET:HA	1:B:174:PHE:O	2.18	0.43
1:N:94:ILE:HG13	1:N:94:ILE:O	2.17	0.43
1:G:129:GLY:HA2	1:N:130:ALA:O	2.17	0.43
1:H:59:LYS:O	1:H:87:PRO:HB3	2.18	0.43
1:E:84:PHE:CE1	1:F:191:LEU:HG	2.52	0.43
1:I:21:ILE:HD11	1:J:51:PHE:CB	2.48	0.43
1:E:179:LYS:HD2	1:E:179:LYS:C	2.39	0.43
1:C:156:ALA:HB1	1:C:161:GLN:O	2.17	0.43
1:M:140:ILE:O	1:M:144:ILE:HG13	2.18	0.43
1:B:56:ASP:CG	1:B:59:LYS:HG3	2.39	0.43
1:G:172:ARG:HH12	1:M:172:ARG:HH12	1.67	0.43
1:G:116:LEU:HB3	1:G:117:PRO:HD2	2.00	0.43
1:K:157:GLN:HB3	1:K:157:GLN:HE21	1.66	0.43
1:H:60:ASP:OD1	1:H:88:ASP:HB2	2.18	0.43
1:E:121:ILE:HD12	1:E:121:ILE:N	2.32	0.43
1:B:99:ALA:HB1	2:P:204:ALA:C	2.39	0.43
1:A:134:ALA:HA	1:H:144:ILE:HD13	2.00	0.43
1:C:116:LEU:HA	1:C:116:LEU:HD23	1.77	0.43
1:J:86:ARG:N	1:J:87:PRO:CD	2.82	0.43
1:I:141:SER:O	1:I:144:ILE:HG22	2.19	0.43
1:C:164:GLU:O	1:C:168:LYS:HG3	2.19	0.43
1:J:76:LEU:HD21	1:J:151:MET:HE1	2.00	0.42
1:N:59:LYS:HD3	3:N:198:HOH:O	2.18	0.42
1:I:22:TYR:HE1	1:I:32:LEU:HD12	1.84	0.42
1:G:163:LEU:C	1:G:163:LEU:HD23	2.40	0.42
1:K:42:ALA:O	1:K:46:VAL:HG23	2.19	0.42
1:F:116:LEU:HB3	1:F:117:PRO:HD2	1.99	0.42
2:Z:201:ALA:HB1	3:Z:124:HOH:O	2.19	0.42
1:M:29:ARG:HG2	1:M:52:LEU:HD22	2.01	0.42
1:D:38:ASN:OD1	1:D:40:SER:HB3	2.19	0.42
1:N:99:ALA:HB1	2:2:204:ALA:C	2.40	0.42
1:B:130:ALA:O	1:I:129:GLY:HA2	2.19	0.42
1:K:182:LYS:CE	1:K:189:LYS:HA	2.34	0.42
1:B:86:ARG:HB2	1:B:87:PRO:HD3	2.01	0.42
1:A:24:ARG:O	1:A:24:ARG:HD3	2.20	0.42
1:H:24:ARG:HD3	1:H:24:ARG:O	2.19	0.42
1:L:21:ILE:HG23	1:L:22:TYR:H	1.85	0.42
1:J:151:MET:O	1:J:155:LEU:HB2	2.19	0.42
1:L:177:SER:OG	1:L:180:GLU:HG3	2.20	0.42
1:K:21:ILE:CG2	1:K:22:TYR:N	2.83	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:N:21:ILE:HG23	1:N:22:TYR:N	2.34	0.42
1:E:20:ASP:HB3	1:E:23:SER:OG	2.20	0.42
1:L:55:GLU:O	1:L:56:ASP:HB2	2.20	0.42
1:H:86:ARG:N	1:H:87:PRO:CD	2.83	0.42
1:J:116:LEU:HB3	1:J:117:PRO:HD2	2.02	0.42
1:C:85:ILE:HD12	1:C:87:PRO:HG2	2.01	0.42
1:C:24:ARG:O	1:C:27:LYS:HB2	2.20	0.42
1:A:24:ARG:C	1:A:24:ARG:HD3	2.40	0.42
1:L:78:ILE:O	1:L:82:MET:HG3	2.19	0.42
1:E:150:LEU:HD23	1:E:150:LEU:C	2.40	0.42
1:A:71:VAL:HB	1:A:74:SER:OG	2.19	0.42
1:A:129:GLY:HA2	1:H:130:ALA:O	2.19	0.42
1:K:32:LEU:CD2	1:K:64:TYR:HB2	2.37	0.42
1:E:85:ILE:HD12	1:E:87:PRO:HG2	2.00	0.42
1:B:124:HIS:O	1:B:124:HIS:HD2	2.02	0.42
1:L:151:MET:O	1:L:155:LEU:HB2	2.20	0.41
1:A:71:VAL:O	1:A:74:SER:HB2	2.20	0.41
1:K:79:TYR:CD1	1:K:107:CYS:SG	3.12	0.41
1:B:21:ILE:HG23	1:B:22:TYR:N	2.34	0.41
1:D:21:ILE:HD13	1:D:21:ILE:C	2.41	0.41
1:B:116:LEU:HB3	1:B:117:PRO:HD2	2.01	0.41
1:A:134:ALA:HB3	1:H:125:GLN:NE2	2.36	0.41
1:H:86:ARG:NH1	1:H:86:ARG:HG3	2.36	0.41
1:F:21:ILE:CG2	1:F:22:TYR:N	2.82	0.41
1:C:94:ILE:HG22	1:C:116:LEU:CD1	2.51	0.41
1:E:94:ILE:O	1:E:94:ILE:HG13	2.21	0.41
1:F:127:LEU:HD23	1:M:133:GLN:HG2	2.02	0.41
1:B:72:ILE:HG13	2:P:203:ALA:HA	2.02	0.41
1:I:59:LYS:O	1:I:87:PRO:HB3	2.21	0.41
1:L:85:ILE:HB	1:L:87:PRO:HD2	2.02	0.41
1:J:42:ALA:HA	1:J:78:ILE:HD11	2.03	0.41
1:L:103:PHE:CD1	1:L:155:LEU:HD13	2.55	0.41
1:K:97:ALA:O	1:K:102:ALA:HB2	2.20	0.41
1:E:124:HIS:CD2	1:E:124:HIS:C	2.94	0.41
1:M:118:HIS:CD2	1:N:80:ASP:OD1	2.64	0.41
1:J:56:ASP:CG	1:J:59:LYS:HD3	2.40	0.41
1:I:164:GLU:CD	1:I:164:GLU:H	2.24	0.41
1:E:179:LYS:HE2	1:E:180:GLU:HG3	2.02	0.41
1:F:72:ILE:HG12	1:F:100:MET:CE	2.50	0.41
1:L:93:CYS:SG	1:L:97:ALA:HB2	2.61	0.41
1:L:99:ALA:HB1	2:Z:204:ALA:O	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:86:ARG:N	1:L:87:PRO:CD	2.84	0.41
1:B:79:TYR:CD1	1:B:107:CYS:SG	3.13	0.41
1:H:143:GLU:HA	1:H:143:GLU:OE1	2.20	0.41
1:I:57:PRO:C	1:I:87:PRO:HG3	2.41	0.41
1:A:116:LEU:HD13	1:G:80:ASP:HB3	2.02	0.41
1:D:84:PHE:CZ	1:E:191:LEU:HD13	2.56	0.41
1:J:24:ARG:HG2	1:K:51:PHE:CE1	2.56	0.41
1:C:24:ARG:NH1	1:C:28:ASP:OD1	2.53	0.41
1:C:99:ALA:N	1:C:122:MET:O	2.51	0.41
1:H:182:LYS:NZ	1:H:188:ASP:O	2.51	0.41
1:F:163:LEU:HD13	1:F:163:LEU:C	2.41	0.41
1:H:29:ARG:NH2	1:H:52:LEU:O	2.54	0.41
1:D:51:PHE:CD1	1:E:24:ARG:HD2	2.56	0.41
1:K:85:ILE:HB	1:K:87:PRO:HD2	2.03	0.41
1:J:182:LYS:HD3	1:J:188:ASP:O	2.21	0.41
1:E:52:LEU:HD23	1:E:52:LEU:HA	1.92	0.41
1:K:191:LEU:HD13	1:L:84:PHE:CZ	2.55	0.40
1:A:116:LEU:HB3	1:G:80:ASP:HB3	2.03	0.40
1:D:125:GLN:HE22	1:K:135:SER:H	1.69	0.40
1:L:72:ILE:HG12	1:L:100:MET:CE	2.51	0.40
1:A:121:ILE:N	1:A:121:ILE:HD12	2.35	0.40
1:K:143:GLU:HA	1:K:143:GLU:OE1	2.20	0.40
1:C:129:GLY:HA2	1:J:130:ALA:O	2.21	0.40
1:J:72:ILE:HD11	1:J:126:PRO:HB3	2.03	0.40
1:A:133:GLN:HA	1:H:127:LEU:HD23	2.02	0.40
1:A:80:ASP:OD1	1:B:118:HIS:CD2	2.60	0.40
1:D:58:GLU:HA	1:D:58:GLU:OE1	2.21	0.40
1:M:176:MET:HB2	1:M:180:GLU:HB2	2.02	0.40
1:K:48:GLN:O	1:K:52:LEU:HG	2.21	0.40
1:D:179:LYS:O	1:D:183:GLU:HG3	2.20	0.40
1:K:179:LYS:O	1:K:182:LYS:HB3	2.22	0.40
1:J:179:LYS:HZ1	1:J:192:GLN:HE22	1.68	0.40
1:M:52:LEU:HD23	1:M:52:LEU:HA	1.94	0.40
1:E:112:LYS:HA	1:E:114:PHE:CZ	2.56	0.40
1:H:99:ALA:HB1	2:V:204:ALA:C	2.42	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	171/196 (87%)	167 (98%)	4 (2%)	0	100	100
1	B	171/196 (87%)	166 (97%)	4 (2%)	1 (1%)	30	50
1	C	171/196 (87%)	165 (96%)	6 (4%)	0	100	100
1	D	171/196 (87%)	167 (98%)	4 (2%)	0	100	100
1	E	171/196 (87%)	166 (97%)	5 (3%)	0	100	100
1	F	171/196 (87%)	165 (96%)	5 (3%)	1 (1%)	30	50
1	G	171/196 (87%)	166 (97%)	5 (3%)	0	100	100
1	H	171/196 (87%)	167 (98%)	4 (2%)	0	100	100
1	I	171/196 (87%)	167 (98%)	3 (2%)	1 (1%)	30	50
1	J	171/196 (87%)	164 (96%)	7 (4%)	0	100	100
1	K	171/196 (87%)	165 (96%)	6 (4%)	0	100	100
1	L	171/196 (87%)	165 (96%)	5 (3%)	1 (1%)	30	50
1	M	171/196 (87%)	165 (96%)	6 (4%)	0	100	100
1	N	171/196 (87%)	166 (97%)	5 (3%)	0	100	100
2	1	2/4 (50%)	2 (100%)	0	0	100	100
2	2	2/4 (50%)	2 (100%)	0	0	100	100
2	O	2/4 (50%)	2 (100%)	0	0	100	100
2	P	2/4 (50%)	2 (100%)	0	0	100	100
2	Q	2/4 (50%)	2 (100%)	0	0	100	100
2	R	2/4 (50%)	2 (100%)	0	0	100	100
2	S	2/4 (50%)	1 (50%)	1 (50%)	0	100	100
2	T	2/4 (50%)	2 (100%)	0	0	100	100
2	U	2/4 (50%)	2 (100%)	0	0	100	100
2	V	2/4 (50%)	2 (100%)	0	0	100	100
2	W	2/4 (50%)	2 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	X	2/4 (50%)	2 (100%)	0	0	100	100
2	Y	2/4 (50%)	2 (100%)	0	0	100	100
2	Z	2/4 (50%)	2 (100%)	0	0	100	100
All	All	2422/2800 (86%)	2348 (97%)	70 (3%)	4 (0%)	52	75

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	191	LEU
1	I	56	ASP
1	L	56	ASP
1	F	56	ASP

### 5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	144/165 (87%)	138 (96%)	6 (4%)	36	62
1	B	144/165 (87%)	139 (96%)	5 (4%)	43	70
1	C	144/165 (87%)	142 (99%)	2 (1%)	74	91
1	D	144/165 (87%)	138 (96%)	6 (4%)	36	62
1	E	144/165 (87%)	140 (97%)	4 (3%)	51	78
1	F	144/165 (87%)	141 (98%)	3 (2%)	61	85
1	G	144/165 (87%)	141 (98%)	3 (2%)	61	85
1	H	144/165 (87%)	138 (96%)	6 (4%)	36	62
1	I	144/165 (87%)	138 (96%)	6 (4%)	36	62
1	J	144/165 (87%)	140 (97%)	4 (3%)	51	78
1	K	144/165 (87%)	137 (95%)	7 (5%)	31	55
1	L	144/165 (87%)	142 (99%)	2 (1%)	74	91
1	M	144/165 (87%)	140 (97%)	4 (3%)	51	78

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	N	144/165 (87%)	139 (96%)	5 (4%)	43 70
All	All	2016/2310 (87%)	1953 (97%)	63 (3%)	47 75

All (63) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	24	ARG
1	A	34	SER
1	A	66	ASN
1	A	124	HIS
1	A	155	LEU
1	A	163	LEU
1	B	24	ARG
1	B	38	ASN
1	B	55	GLU
1	B	124	HIS
1	B	186	LEU
1	C	28	ASP
1	C	124	HIS
1	D	21	ILE
1	D	24	ARG
1	D	124	HIS
1	D	151	MET
1	D	155	LEU
1	D	163	LEU
1	E	24	ARG
1	E	55	GLU
1	E	124	HIS
1	E	182	LYS
1	F	52	LEU
1	F	124	HIS
1	F	155	LEU
1	G	122	MET
1	G	124	HIS
1	G	144	ILE
1	H	28	ASP
1	H	59	LYS
1	H	124	HIS
1	H	153	SER
1	H	155	LEU
1	H	182	LYS
1	I	24	ARG

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Mol	Chain	Res	Type
1	I	28	ASP
1	I	53	GLU
1	I	124	HIS
1	I	155	LEU
1	I	163	LEU
1	J	53	GLU
1	J	63	LEU
1	J	124	HIS
1	J	182	LYS
1	K	24	ARG
1	K	28	ASP
1	K	33	LEU
1	K	120	ARG
1	K	124	HIS
1	K	163	LEU
1	K	165	GLN
1	L	124	HIS
1	L	155	LEU
1	M	24	ARG
1	M	28	ASP
1	M	124	HIS
1	M	163	LEU
1	N	24	ARG
1	N	53	GLU
1	N	124	HIS
1	N	155	LEU
1	N	163	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (53) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	66	ASN
1	A	83	ASN
1	A	118	HIS
1	A	125	GLN
1	A	131	GLN
1	A	152	ASN
1	A	158	ASN
1	B	38	ASN
1	B	118	HIS
1	B	125	GLN
1	B	131	GLN

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Mol	Chain	Res	Type
1	B	165	GLN
1	C	125	GLN
1	C	161	GLN
1	C	165	GLN
1	D	118	HIS
1	D	125	GLN
1	D	131	GLN
1	E	83	ASN
1	E	118	HIS
1	E	125	GLN
1	E	192	GLN
1	F	118	HIS
1	F	125	GLN
1	F	157	GLN
1	F	165	GLN
1	G	118	HIS
1	G	125	GLN
1	H	66	ASN
1	H	118	HIS
1	H	125	GLN
1	I	118	HIS
1	I	125	GLN
1	I	152	ASN
1	I	157	GLN
1	I	165	GLN
1	J	96	GLN
1	J	125	GLN
1	J	192	GLN
1	K	118	HIS
1	K	125	GLN
1	K	157	GLN
1	L	118	HIS
1	L	125	GLN
1	L	161	GLN
1	M	83	ASN
1	M	118	HIS
1	M	125	GLN
1	M	165	GLN
1	N	83	ASN
1	N	118	HIS
1	N	125	GLN
1	N	152	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

### 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

### 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

### 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

### 5.7 Other polymers [i](#)

There are no such residues in this entry.

### 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data ⓘ

### 6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	173/196 (88%)	-0.22	3 (1%) 73 76	21, 29, 47, 57	0
1	B	173/196 (88%)	0.15	7 (4%) 42 47	21, 31, 51, 59	0
1	C	173/196 (88%)	0.07	6 (3%) 48 53	21, 33, 53, 63	0
1	D	173/196 (88%)	0.06	4 (2%) 64 67	23, 34, 58, 69	0
1	E	173/196 (88%)	0.05	6 (3%) 48 53	21, 32, 52, 73	0
1	F	173/196 (88%)	-0.07	5 (2%) 55 60	20, 32, 52, 69	0
1	G	173/196 (88%)	0.03	4 (2%) 64 67	18, 28, 47, 65	0
1	H	173/196 (88%)	-0.06	3 (1%) 73 76	19, 27, 46, 61	0
1	I	173/196 (88%)	0.01	5 (2%) 55 60	20, 29, 49, 62	0
1	J	173/196 (88%)	-0.06	5 (2%) 55 60	20, 30, 49, 62	0
1	K	173/196 (88%)	0.08	5 (2%) 55 60	22, 35, 54, 61	0
1	L	173/196 (88%)	0.14	10 (5%) 26 30	23, 34, 56, 69	0
1	M	173/196 (88%)	-0.05	4 (2%) 64 67	22, 30, 55, 67	0
1	N	173/196 (88%)	-0.12	3 (1%) 73 76	21, 30, 53, 60	0
2	1	4/4 (100%)	0.42	1 (25%) 1 1	34, 34, 36, 41	0
2	2	4/4 (100%)	-0.37	0 100 100	29, 29, 32, 36	0
2	O	4/4 (100%)	1.20	1 (25%) 1 1	37, 38, 38, 43	0
2	P	4/4 (100%)	0.34	1 (25%) 1 1	28, 30, 31, 33	0
2	Q	4/4 (100%)	0.13	0 100 100	38, 39, 39, 40	0
2	R	4/4 (100%)	0.86	1 (25%) 1 1	37, 37, 38, 40	0
2	S	4/4 (100%)	-0.44	0 100 100	34, 35, 35, 39	0
2	T	4/4 (100%)	0.09	0 100 100	32, 32, 33, 38	0
2	U	4/4 (100%)	0.15	0 100 100	36, 36, 36, 39	0
2	V	4/4 (100%)	0.26	0 100 100	31, 33, 33, 36	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
2	W	4/4 (100%)	0.41	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	31, 33, 33, 35	0
2	X	4/4 (100%)	-0.39	0 <span style="border: 1px solid blue; padding: 2px;">100</span> <span style="border: 1px solid blue; padding: 2px;">100</span>	35, 36, 38, 38	0
2	Y	4/4 (100%)	0.83	2 (50%) <span style="border: 1px solid red; padding: 2px;">0</span> <span style="border: 1px solid red; padding: 2px;">0</span>	35, 36, 37, 40	0
2	Z	4/4 (100%)	0.52	1 (25%) <span style="border: 1px solid red; padding: 2px;">1</span> <span style="border: 1px solid red; padding: 2px;">1</span>	34, 35, 39, 43	0
All	All	2478/2800 (88%)	0.01	77 (3%) <span style="border: 1px solid gray; padding: 2px;">52</span> <span style="border: 1px solid gray; padding: 2px;">57</span>	18, 31, 53, 73	0

All (77) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	M	110	LYS	4.3
1	A	58	GLU	3.7
1	C	192	GLN	3.7
1	L	192	GLN	3.6
1	C	20	ASP	3.6
1	N	192	GLN	3.5
1	L	86	ARG	3.5
1	B	57	PRO	3.4
1	J	163	LEU	3.4
1	J	164	GLU	3.4
1	L	58	GLU	3.3
1	E	192	GLN	3.3
1	F	20	ASP	3.2
1	K	24	ARG	3.2
1	L	163	LEU	3.0
1	G	192	GLN	3.0
1	K	58	GLU	3.0
1	L	110	LYS	2.9
1	M	21	ILE	2.9
1	A	192	GLN	2.9
1	I	54	ALA	2.9
1	C	27	LYS	2.8
1	F	110	LYS	2.8
1	D	192	GLN	2.8
1	F	192	GLN	2.8
1	M	20	ASP	2.8
1	I	164	GLU	2.7
1	K	20	ASP	2.7
1	K	56	ASP	2.6
1	L	21	ILE	2.6
1	L	164	GLU	2.6
2	Y	201	ALA	2.6

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Mol	Chain	Res	Type	RSRZ
1	B	86	ARG	2.6
1	I	163	LEU	2.5
1	I	86	ARG	2.5
1	A	130	ALA	2.5
1	F	168	LYS	2.4
1	J	58	GLU	2.4
1	J	192	GLN	2.4
1	C	86	ARG	2.4
1	J	20	ASP	2.4
2	R	201	ALA	2.4
1	G	86	ARG	2.3
1	D	58	GLU	2.3
2	1	201	ALA	2.3
1	N	86	ARG	2.3
1	E	86	ARG	2.3
1	C	23	SER	2.3
1	D	86	ARG	2.3
1	E	55	GLU	2.3
1	G	20	ASP	2.3
1	N	54	ALA	2.2
1	F	183	GLU	2.2
1	D	189	LYS	2.2
1	M	24	ARG	2.2
1	E	59	LYS	2.2
1	B	21	ILE	2.2
1	E	110	LYS	2.2
1	L	57	PRO	2.2
1	B	58	GLU	2.2
1	I	21	ILE	2.2
1	L	23	SER	2.2
1	B	183	GLU	2.2
1	B	110	LYS	2.2
1	E	58	GLU	2.2
2	P	201	ALA	2.1
2	Z	201	ALA	2.1
1	G	163	LEU	2.1
2	O	201	ALA	2.1
1	H	192	GLN	2.0
2	Y	202	ALA	2.0
1	K	63	LEU	2.0
1	H	24	ARG	2.0
1	H	164	GLU	2.0

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Mol	Chain	Res	Type	RSRZ
1	C	54	ALA	2.0
1	L	20	ASP	2.0
1	B	27	LYS	2.0

## 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

## 6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 6.4 Ligands [i](#)

There are no ligands in this entry.

## 6.5 Other polymers [i](#)

There are no such residues in this entry.